Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1.-29. (Cancel)

30. (New) A method for determining a similarity score of a target object with respect to a model object, said target object being in a plane and said model object represented by a model feature vector, the method comprising:

generating regions of the plane according to a first mass distribution of the target object and a second mass distribution of a part of said target object, each of said regions having a corresponding mass distribution indicator;

calculating a target feature vector for said target object according to at least one of said corresponding mass distribution indicators; and

computing said similarity score using said target feature vector and said model feature vector.

31. (New) The method as in claim 30 wherein said generating comprises partitioning said plane to generate said regions according to said first mass distribution and said second mass distribution of a part of said target object.

32. (New) The method as in claim 31 wherein said partitioning said plane comprises:

partitioning said plane into global parts according to said first mass distribution; and

partitioning said global parts into disjoint parts according to said second mass distribution.

33. (New) The method as in claim 32 wherein said generating further comprises combining said disjoint parts to obtain a set of regions.

34. (New) The method as in claim 32 wherein said partitioning said plane according to said first mass distribution comprises calculating a global center of mass of said target object and using axes passing through said global center of mass for partitioning said plane.

35. (New) The method as in claim 34 wherein said partitioning according to said first mass distribution comprises partitioning said plane into quadrants having axes passing through said global center of mass.

36. (New) The method as in claim 35 wherein said partitioning according to said second mass distribution comprises calculating a center of mass of each of said quadrants and using axes passing through each center of mass of said quadrants for partitioning corresponding quadrants.

37. (New) The method as claimed in claim 34 wherein said partitioning according to said second mass distribution comprises, for each half-plane bordered by one of said axes passing through said global center of mass, locating an axis parallel to the axis bordering the half-plane and passing through the center of mass of the half-plane and using the determined axis to partition the half-plane.

38. (New) A method as in claim 32 wherein said generating further comprises selecting said disjoint parts to obtain a set of regions.

39. (New) The method as in claim 30 wherein said computing said similarity score comprises calculating a Euclidean distance between said target feature vector and said model feature vector.

40. (New) The method as in claim 30 wherein said computing said similarity score comprises computing a similarity score that is independent of variations in scale of at least one of said model object and said target object.

41. (New) The method of claim 30 wherein said model object is in said plane, the method further comprising:

generating regions of the plane according to a first mass distribution of the model object and a second mass distribution of a part of said model object, each of said regions generated for said model object having a corresponding model mass distribution indicator; and

calculating a model feature vector for said model object according to at least one of said corresponding model mass distribution indicators.

42. (New) The method as in claim 30 wherein said model object is taken from a bank of model objects, each of said model objects is represented by a model feature vector, and wherein said computing said similarity score comprises computing a similarity score for each couple comprising said target feature vector and one of said model feature vectors.

43. (New) The method as in claim 42 further comprising, for each said couple comprising said target feature vector and one of said model feature vectors, associating a given weight vector.

44. (New) The method as in claim 30 further comprising associating a given weight vector to the couple comprising said model feature vector and said target feature vector.

45. (New) The method as in claim 44 wherein said computing said similarity score comprises further using said given weight vector.

46. (New) A method for comparing a target object in a plane and a model object represented by a model feature vector, the method comprising:

generating first parts of said plane according to a first mass distribution indicator of the target object;

partitioning said first parts into disjoint parts according to a second mass distribution indicator of a part of said target object;

combining said disjoint parts to obtain a set of regions;

calculating a target feature vector for said target object according to a third mass distribution indicator; and

performing a comparison between said target feature vector and said model feature vector.

47. (New) The method as in claim 46 further comprising using said comparison to determine a match between said target object and said model object.

48. (New) The method as in claim 46, wherein the first parts are half planes bordered on one side by a first axis that passes through an origin defined by the first mass distribution indicator.

49. (New) The method as in claim 48, wherein the disjoint parts are defined by constructing, for each half plane, a second axis that is parallel to the first axis and that passes through an origin in the half plane defined by the second mass distribution indicator.

50. (New) The method as in claim 48, wherein the first mass distribution indicator is the center of mass of the target object, the second mass distribution indicator is the center of mass of the half planes, and the third mass distribution indicator is a first order moment of the regions.

51. (New) The method as in claim 48, wherein the first mass distribution indicator is the center of mass of the target object, the second mass distribution indicator is the center of mass of the half planes, and the third mass distribution indicator is a coordinate of the center of mass of the regions.

52. (New) The method as in claim 49, wherein the first mass distribution indicator is the center of mass of the target object, the second mass distribution indicator is the center of

mass of the half planes, and the third mass distribution indicator is a first order moment of the regions.

53. (New) A method as in claim 30 wherein said corresponding mass distribution indicator comprises a first order geometric moment of said generated region.

54. (New) A method for comparing a target object and a model object, said target object being in a plane and said model object represented by a first model feature vector and a second model feature vector, the method comprising:

generating regions of the plane;

determining a first target feature vector associated with a first direction of said plane by determining a first target feature associated with said first direction in one or more of said regions;

determining a second target feature vector associated with a second direction of said plane by determining a second target feature associated with said second direction in one or more of said regions;

computing a first similarity score using said first target feature vector and said first model feature vector; and

computing a second similarity score using said second target feature vector and said second model feature vector.

55. (New) A method as claimed in claim 54, wherein said target object and said model object have different scale ratios in said first and second directions.

56. (New) A method as claimed in claim 54, further comprising determining a third similarity score by combining said first and said second similarity scores.

57. (New) A method as claimed in claim 56, wherein said third similarity score is invariant to independent scale variations in said first and second directions.

58. (New) A method as claimed in claim 54, wherein said model object is in a model plane, the method further comprising:

generating regions of said model plane;

determining a first model feature vector associated with a first direction of said model plane by determining a first model feature associated with said first direction of the model plane in one or more of said regions of the model plane; and

determining a second model feature vector associated with a second direction of said model plane by determining a second model feature associated with said second direction of the model plane in one or more of said regions of the model plane.

59. (New) A method as claimed in claim 54, wherein at least one of said first target feature and said second target feature is a mass distribution indicator.

60. (New) A method as claimed in claim 59, wherein said mass distribution indicator is a first order geometric moment.

61. (New) A method as claimed in claim 54, wherein said first similarity score is independent of a difference in scale in said first direction between said target object and said model object, and wherein said second similarity score is independent of a difference in scale in said second direction between said target object and said model object.

62. (New) A method as claimed in claim 54, wherein said first similarity score is independent of a scaling factor between said first target feature vector and said first model feature vector, and wherein said second similarity score is independent of a scaling factor between said second target feature vector and said second model feature vector.

63. (New) A method as claimed in claim 62, wherein said computing a first similarity score comprises determining a scalar product between said first target feature vector and said first model feature vector, dividing said scalar product by the product of the magnitudes

of said first target feature vector and said first model feature vector, and performing the square of the result, and wherein

said computing a second similarity score comprises determining a second scalar product between said second target feature vector and said second model feature vector, dividing said second scalar product by the product of the magnitudes of said second target feature vector and said second model feature vector to obtain a second result, and performing the square of said second result.

64. (New) A method as claimed in claim 54, wherein said generating regions of the plane comprises partitioning said plane.

65. (New) A method as claimed in claim 64, wherein said partitioning comprises partitioning said plane according to a mass distribution of the target object.

66. (New) A method as claimed in claim 65, wherein said partitioning further comprises partitioning said plane according to a first mass distribution of the target object and a second mass distribution of a part of said target object.